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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,934	11/01/2001	Gopal B. Avinash	120768	3510

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EXAMINER

PATEL, SHEFALI D

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/682,934	<b>Applicant(s)</b> AVINASH, GOPAL B.	
	<b>Examiner</b> Shefali D. Patel	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-12, 14-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-12 and 14-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Appeal brief was filed on March 23, 2006.
2. There are new grounds of rejection made in this action with regard to 35 U.S.C. 101 and, therefore, the finality of that action (mailed on September 30, 2005) is withdrawn. And, the examiner hereby reopens the prosecution.

#### *Claim Rejections - 35 USC § 101*

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1 and 10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 1 is drawn to a process that merely manipulates data or an abstract idea, or merely solves a mathematical problem without a limitation to a practical application in the technological arts. One may not patent a process that comprises every “substantial practical application” of an abstract idea, because such a patent “in practical effect would be a patent on the [abstract idea] itself.”

In order for a claimed invention to accomplish a practical application, it must produce a “useful, concrete and tangible result” *State Street*, 149 F.3d at 1373, 47 USPQ2d at 1601-02 (see MPEP 2106.II.A). A practical application can be achieved through recitation of “a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan”, or “limited to a practical application within the technological arts” (MPEP 2106 IVB2(b)). Currently, claims 1 and 10 meet neither of these criteria. In order to for the claimed process to produce a “useful, concrete and tangible” result, recitation of one or more of the following elements is suggested:

- The manipulation of data that represents a physical object or activity transformed from outside the computer (MPEP 2106 IVB2(b)(i)).

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- A recitation of a physical transformation outside the computer, for example in the form of pre or post computer processing activity (MPEP 2106 IVB2(b)(i)).
- A direct recitation of a practical application in the technological arts (MPEP 2106 IVB2(b)(ii)).

5. Dependent claims 2-9 and 11-17 are rejected for the same reasons.

6. A possible suggestion to amend the claim 1, for example, to overcome the at least prior art rejection by Bruijns and Bolorforosh, by the examiner is to amend claim 1 to state that the numerator is for the first image and the denominator is for the second image as disclosed in the specification on page 4 paragraph 18 and 19.

*Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-2, 5, 7, 9-11, 14, 16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruijns et al. (hereinafter, "Bruijns") (US 5,974,113) in view of Bolorforosh et al. (hereinafter, "Bolorforosh") (US 6,132,377).

With regard to claim 1 Bruijns discloses a method of contrast matching a first image and a second image (col. 6 lines 35-47) comprising: generating an image ratio of the first image (S1) and the second image (S2) (obtaining ratio by using quotient unit 17 at col. 6 lines 64-67), *said ratio having a numerator and a denominator*; filtering the *regularized* image ratio to form a filtered ratio (using filter 19 at col. 7 lines 9-17); and multiplying the second image by the filtered ratio to form an adjusted image (multiplying image S2 by the quotient at col. 7 lines 15-23). Bruijns does not expressly disclose ratio

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having a numerator and a denominator; regularizing the image ratio by adding a constant to the denominator to form a regularized ratio. It is obvious to one of ordinary skill in the art that by definition ratio has a numerator and a denominator. Nonetheless, Bolorforosh discloses ratio by adding a constant to the denominator to form a regularized ratio at col. 6 lines 53-61. Note, Bolorforosh discloses fundamental receive signal (first image) and harmonic receive signal (second image) at col. 3 lines 19-66, col. 4 lines 17-26 and col. 6 lines 42-52. This ratio is computed for these two signals (from an image), which would be the same as the two images in Bruijns. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Bolorforosh with Bruijns. The motivation for doing so is to have the ratio for using to modulate the image signal to enhance the display of contrast agent as disclosed at col. 2 lines 29-40 in Bolorforosh. Therefore, it would have been obvious to combine Bolorforosh with Bruijns to obtain the invention as specified in claim 1. Also, Bolorforosh merely provides a definition of the regularized ratio and what makes it regularized. Hence this one type of ratio is the same as the ratio used in Bruijns' except that the denominator has a constant making it regularized to remove artifacts in the image (or a signal).

With regard to **claim 2** Bruijns discloses a low pass filter 19 at col. 7 lines 9-17.

With regard to **claim 5** as disclosed in claim 1 above, Bruijns in view of Bolorforosh discloses regularizing that comprises multiplying the numerator by the second image and the denominator by the second image and adding the constant to the denominator.

With regard to **claim 7** Bruijns discloses multiplying the second image by the filtered ratio to form the adjusted image where the adjusted image is brightness matched to the first image (col. 7 lines 27-30 and col. 8 lines 46-53).

With regard to **claim 9** Bruijns discloses prior to filtering, regularizing an image ratio of the second image with respect to the first image to form a regularized image ratio (col. 6 lines 52 to col. 7 lines 1-9).

**Claim 10** recites identical features as claim 1 except claim 10 is a method claim of operating a digital image device. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 10. Applicant's attention is invited to Figures 2 and 3 of Bruijns. Bruijns discloses generating first (S1) and second (S2) digital image (col. 6 lines 15-17, Figure 1) and matching the second image to the first image (see, col. 6 lines 46-51).

**Claim 11** recites identical features as claim 2. Thus, arguments similar to that presented above for claim 2 is equally applicable to claim 11.

**Claim 14** recites identical features as claim 5. Thus, arguments similar to that presented above for claim 5 is equally applicable to claim 14.

**Claim 16** recites identical features as claim 7. Thus, arguments similar to that presented above for claim 7 is equally applicable to claim 16.

**Claim 18** recites identical features as claim 1 except claim 18 is a system claim. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 18. Applicant's attention is invited to Figures 2 and 3 of Bruijns. Bruijns discloses a control unit 14 and a memory unit 41 in the system 40.

With regard to **claim 19** Bruijns discloses a display 35 as seen in Figure 1, which is connected to a controller 14 included in element 40.

With regard to **claim 20** Bruijns discloses a storage medium 41 as seen in Figure 2 and col. 7 lines 42-55.

9. Claims 3, 6, 8, 12, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruijns et al. (hereinafter, "Bruijns") (US 5,974,113) in view of Bolorforosh et al. (hereinafter,

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“Bolorforosh”) (US 6,132,377) as applied to claims 1-2, 5, 7, 9-11, 14, 16, and 18-20 above, and further in view of Poland (US 6,080,107).

With regard to **claim 3** Bruijns (modified by Bolorforosh ) discloses a low pass filter as disclosed above in claims 1-2 and the arguments are not repeated herein, but are incorporated by reference. Bruijns does not expressly disclose a boxcar filter. Poland discloses a boxcar filter at element 90 in Fig. 1 and at col. 13 lines 37-46. Bruijns, Bolorforosh and Poland are combinable because they are from the same field of endeavor, i.e., image processing in medical imaging. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Poland with Bruijns and Bolorforosh. The motivation for doing so is to reduce noise content and improve its accuracy. Therefore, it would have been obvious to combine Poland with Bruijns and Bolorforosh to obtain the invention as specified in claim 3.

With regard to **claim 6** Bruijns discloses the adjusted image is brightness matched to the first image as disclosed above in claim 7 and the arguments are not repeated herein, but are incorporated by reference. Bruijns does not expressly disclose the adjusted image is contrast matched to the first image. Poland discloses this at col. 11 lines 58-65 and col. 12 lines 21-34. Bruijns, Bolorforosh and Poland are combinable because they are from the same field of endeavor, i.e., image processing in medical imaging. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Poland with Bruijns and Bolorforosh. The motivation for doing so is to eliminate the radiation hazard and to determine the difference between the two images by analyzing contrast. Therefore, it would have been obvious to combine Poland with Bruijns and Bolorforosh to obtain the invention as specified in claim 6.

**Claim 8** recites identical features as claims 6-7. Thus, arguments similar to that presented above for claims 6-7 is equally applicable to claim 8.

**Claim 12** recites identical features as claim 3. Thus, arguments similar to that presented above for claim 3 is equally applicable to claim 12.

**Claim 15** recites identical features as claim 6. Thus, arguments similar to that presented above for claim 6 is equally applicable to claim 15.

**Claim 17** recites identical features as claim 8. Thus, arguments similar to that presented above for claim 8 is equally applicable to claim 17.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shefali D. Patel whose telephone number is 571-272-7396. The examiner can normally be reached on M-F 8:00am - 5:00pm (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shefali D Patel  
Examiner  
Art Unit 2624

April 18, 2006

JINGGEWU  
PRIMARY EXAMINER

